

WHAT IS CLAIMED IS:

1. A holding device for holding a plurality of ferromagnetic parts, said holding device comprising:

5 a holder defining a plurality of cavities within which the parts may be disposed, said cavities being spaced apart and arranged in a row; and
 a bar movably mounted to the holder and disposed parallel to the row of the cavities, said bar including a plurality of spaced-apart magnetic bodies arranged in a row, said bar being movable in the direction of the row of the
10 cavities between first and second positions, wherein when the parts are disposed in the cavities and the bar is in the first position, the magnetic bodies are aligned with the cavities and the magnetic attraction forces generated by the magnetic bodies hold the parts in the cavities, and wherein when the parts are disposed in the cavities and the bar is in the second position, the magnetic bodies are not
15 aligned with the cavities and the magnetic attraction forces generated by the magnetic bodies do not hold the parts in the cavities.

2. The holding device of claim 1, wherein the holding device further comprises a spring that biases the bar to the first position.

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3. The supply system of claim 2, wherein an end portion of the bar comprises a rotatable bearing.

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4. The holding device of claim 1, wherein when the parts are disposed in the cavities and the bar is in the first position, portions of the holder are aligned with the magnetic bodies and are disposed between the magnetic bodies and the parts, said portions being composed of a ferromagnetic or a paramagnetic material.

5. The holding device of claim 4, wherein the holder comprises a holding structure having a plurality of bores formed therein and a plurality of guide pockets disposed in the bores, said guide pockets defining the cavities.

5 6. The holding device of claim 5, wherein the bores in the holding structure extend through a surface of the holding structure so as to form a plurality of slots in the holding structure that extend along the lengths of the bores.

10 7. The holding device of claim 6, wherein the holder further comprises a bar guide and a bar keep that cooperate to define a guide passage within which the bar is slidably disposed, and wherein the bar guide is secured to the holding structure, over the slots in the holding structure.

15 8. The holding device of claim 7, wherein when the bar is in the first position, the magnetic bodies are aligned with the slots in the holding structure, respectively.

9. The holding device of claim 8, wherein the guide pockets and the bar guide are composed of paramagnetic material.

20 10. The holding device of claim 9, wherein the holding structure is composed of paramagnetic material.

25 11. The holding device of claim 10, wherein the holding structure is composed of aluminum and the guide pockets and the bar guide are composed of stainless steel.

30 12. The holding device of claim 1, wherein the bar further comprises an elongated base and an elongated cover that cooperate to define a plurality of voids within which the magnetic bodies are disposed.

13. The holding device of claim 12, wherein the base and the cover are composed of paramagnetic material.

14. The holding device of claim 13, wherein the bar further comprises a contact device secured to an end portion of the base, said contact device comprising a head defining a socket that rotatably holds a spherical bearing.

15. The holding device of claim 14, wherein the holding device further comprises a spring disposed between the holder and the contact device, said spring biasing the bar to the first position.

16. The holding device of claim 1, wherein the magnetic bodies are permanent magnets.

15 17. The holding device of claim 1, wherein the parts are valve guide inserts for an internal combustion engine.

18. A supply system for supplying a plurality of ferromagnetic parts to an installing device, said supply system comprising:

20 (a.) a mounting structure movable between a return position and a load position;

(b.) a holding device connected to the mounting structure for movement therewith, said holding device comprising:

25 a holder defining a plurality of cavities within which the parts may be disposed, said cavities being spaced apart and arranged in a row;

a bar movably mounted to the holder and disposed parallel to the row of the cavities, said bar including a plurality of spaced-apart magnetic bodies arranged in a row, said bar being movable in the direction of the row of the cavities between first and second positions, wherein when the parts are disposed in the cavities and the bar is in the first position, the magnetic bodies are aligned with the cavities and the magnetic attraction

forces generated by the magnetic bodies hold the parts in the cavities, and wherein when the parts are disposed in the cavities and the bar is in the second position, the magnetic bodies are not aligned with the cavities and the magnetic attraction forces generated by the magnetic bodies do not hold the parts in the cavities; and

5 (c.) at least one actuation structure positioned such that an end portion of the bar contacts the at least one actuation structure during the movement of the mounting structure between the return position and the load position, wherein such contact between the at least one actuation structure and the end portion of
10 the bar moves the bar to the second position.

19. The supply system of claim 18, wherein the holding device further comprises a spring that biases the bar to the first position.

15 20. The supply system of claim 19, wherein when the mounting structure is in the return position, the holder of the holding device is positioned to receive parts in the cavities, and wherein when the mounting structure is in the load position, the holder of the holding device is positioned to deliver the parts to the installing device.

20 21. The supply system of claim 20, wherein the at least one actuation structure comprises a return cam structure and a load cam structure, wherein the return cam structure is positioned to contact the end portion of the bar as the mounting structure is approaching the return position from the load position, and
25 wherein the load cam structure is positioned to contact the end portion of the bar as the mounting structure is approaching the load position from the return position, whereby the bar is in the second position when the mounting structure is in the return position and when the mounting structure is in the load position.

22. The supply system of claim 21, wherein during the travel of the holding device between the return cam structure and the load cam structure, the bar is in the first position.

5 23. The supply system of claim 21, wherein the end portion of the bar that contacts the return cam structure and the load cam structure comprises a rotatable bearing.

10 24. The supply system of claim 23, wherein the load cam structure and the return cam structure each comprise a cam surface positioned at an acute angle to the end portion of the bar when the end portion contacts the cam surface.

15 25. The supply system of claim 18, wherein the holder comprises a holding structure having a plurality of bores formed therein and a plurality of pockets disposed in the bores, said pockets defining the cavities.

26. The supply system of claim 25, wherein the holding structure is composed of a paramagnetic metal and the pockets are composed of a paramagnetic metal.

20 27. The supply system of claim 26, wherein the holding structure is composed of aluminum and the pockets are composed of stainless steel.

25 28. The supply system of claim 18, wherein the magnetic bodies comprise permanent magnets.

29. The supply system of claim 18, wherein the parts are valve guide inserts for an internal combustion engine and the installing device is a guide press unit.

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30. A method of moving ferromagnetic parts to an installing device, said method comprising the steps of:

- providing a holder defining a plurality of cavities;
- providing a plurality of magnetic bodies;
- 5 placing the parts in the cavities of the holder, respectively;
- moving the magnetic bodies so as to be in alignment with the parts, respectively, thereby causing the parts to be held in the cavities;
- moving the holder to the installing device;
- moving the magnetic bodies so as to not be in alignment with the parts,
- 10 thereby permitting the parts to be removed from the cavities; and
- moving the parts from the cavities to the installing device.

31. The method of claim 30, wherein the step of moving the holder comprises rotating the holder and then moving the holder linearly.

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32. The method of claim 30, wherein the parts are valve guide inserts for an internal combustion engine and the installing device is a guide press unit.

33. The method of claim 30, wherein the step of providing a plurality of magnetic bodies comprises providing a bar defining a plurality of interior voids, within which the magnetic bodies are disposed, and wherein the step of moving the magnetic bodies comprises moving the bar.

34. The method of claim 33, wherein the magnetic bodies comprise permanent magnets.